Northgate Coordinated Transportation Plan

Planning, Financing and Technical Assumptions

Prepared for

Northgate Stakeholder Group

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Northgate Coordinated Transportation Investment Plan (CTIP)

Planning, Financing and Technical Assumptions

This report establishes planning, financing and technical assumptions for the Northgate Coordinated Transportation Investment Plan (CTIP).
The assumptions are grouped into the following categories:

- Planning assumptions
- Financing sources
- System performance measures and benchmarks

1. Planning Assumptions

To proceed with the development of a transportation plan for the Northgate area, several assumptions should be clarified at an early stage of the planning process. The consultant and City staff team has identified several key assumptions as follows:

A. Existing Plans

The CTIP will be developed based on the previous plans and studies. It is particularly important to review and evaluate the policies and recommendations in the following plans:

- Northgate Area Comprehensive Plan (1993)
- Open Space and Pedestrian Connections Plan (2004)
- 5th Avenue NE Streetscape Final Design Report

Assumption:

1) Develop CTIP recommendations that will be consistent with previously prepared plans in the Northgate area.

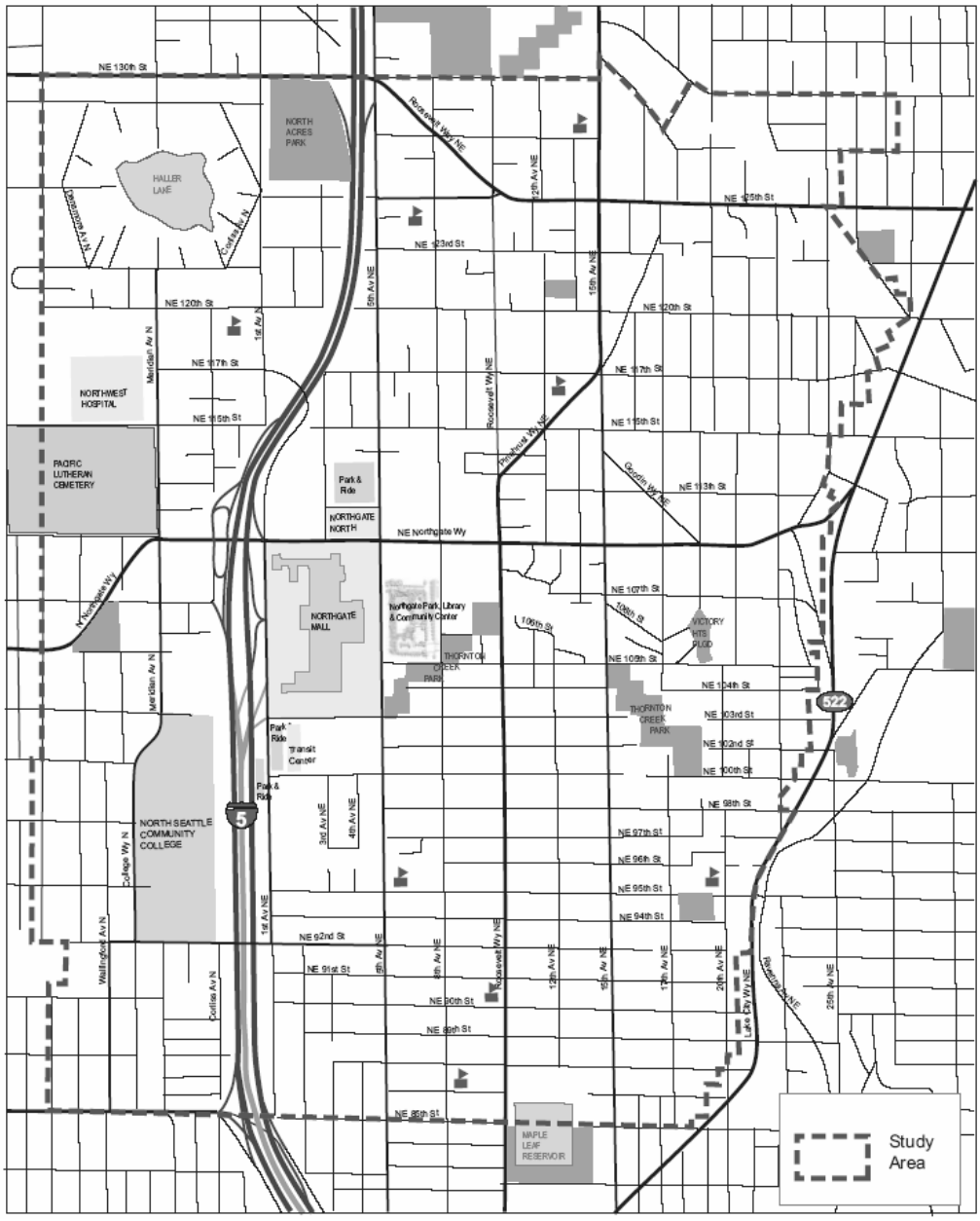
B. Study area

The study area adopted in the 1993 Northgate Area Comprehensive Plan (NACP) study is shown in Figure 1. The boundaries of the Core Overlay Area within the NACP and the Northgate Urban Center were also considered as the potential CTIP study area.

Assumption:

1) The study area of the CTIP should be consistent with the Northgate Comprehensive Plan. The study area boundaries, as designated in the Comprehensive Plan EIS, are defined by Ashworth Avenue N on the west, N 130th Street/125th Street on the north, NE 85th Street on the south, and the west side of Lake City Way on the east, excluding Lake City Way. However, we would analyze traffic that may travel through the study area from access points on Lake City Way.

Figure 1. CTIP Study Area



C. Study Area Growth Assumptions

The CTIP will be developed to support the planned future (2010 and 2030) land use growth in the study area. It is therefore important to clarify the growth assumptions to be used for this study. These assumptions involve use of the Seattle Transportation Demand Forecasting Model ("Seattle Model") for the following three areas: 1) Northgate CTIP study area, 2) the entire City of Seattle area, and 3) the region outside the City.

Assumptions:

1) Review the Seattle Model's assumptions for existing land use, and 2010 and 2030 growth projections.
2) Refine land use projections that the CTIP will use for 2010 and 2030 based on the existing development proposals.

D. Interstate 5

While the City does not have land use or transportation planning responsibility within the State right-of-way, State facilities significantly affect the operation of the City's transportation system. In particular, the current planning activities for I-5 may provide a vehicle by which to implement CTIP recommendations. At the same time, an analysis of I-5's function and operations would be resource-intensive, may duplicate Washington State Department of Transportation (WSDOT) efforts and may distract from higher priority interests in the Northgate area. Therefore, it is important to clarify the City's direction with respect to the consultant's work related to I-5.

Assumptions:

1) Develop and evaluate concepts that would improve east-west pedestrian circulation across I-5
2) Evaluate intersection operations on City arterials at existing I-5 ramps.
3) Coordinate with WSDOT I-5 study.

E. Sound Transit

The Sound Transit Board affirmed its plan to build a light rail system from Downtown Seattle to Northgate, but full funding and project timing remain uncertain.

Sound Transit has initiated planning for Sound Move Phase II, and it is possible that an extension of light rail from Northgate into Snohomish County may be discussed in the near future. Given these uncertain conditions about the future of the North Link light rail extensions, CTIP should assume light rail implementation consistent with City of Seattle policy. The implications of the light rail assumption for the Northgate are mostly related to park and ride demand and parking supply, potential parking spillover, traffic impacts, and pedestrian/bicycle facilities connecting the neighborhoods to the station.

While Sound Transit has identified Northgate as a temporary terminus of the light rail line, it is too speculative to precisely define whether and when the light rail line would be extended to the north from Northgate. The CTIP will not make any statement about how long the Northgate station would remain the temporary terminus. When a decision is made to extend North Link Light Rail, Sound Transit will prepare environmental documents and analyze impacts of such action to the Northgate communities. Therefore, the following is the assumptions that will be used for the CTIP.

Assumptions:

1) Link Light Rail would be extended to the University District by 2020.
2) Link Light Rail would serve Northgate by 2030

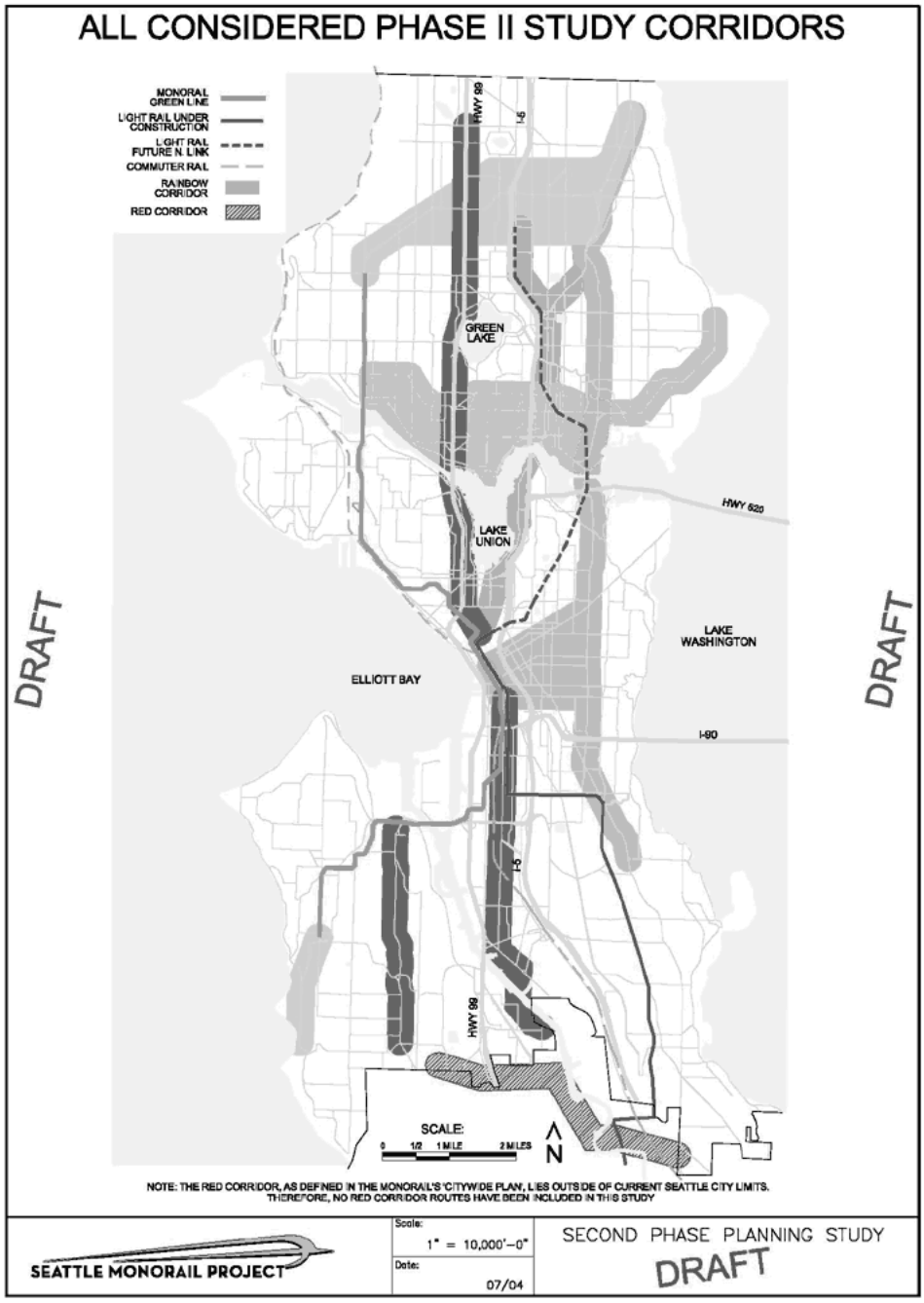
F. Seattle Monorail

The Seattle Monorail Project has initiated planning for Phase II of the Monorail system. Several possible extensions from the current Green Line or new lines have been identified. One of the Phase II options is to extend the Green Line from Crown Hill to Northgate. At this time, it is uncertain which Phase II corridor will be selected. While many uncertainties exist for this project, CTIP needs to make some planning assumptions. A map (Figure 2) showing the corridors for possible extensions in Phase II of the Monorail Project is attached.

Assumptions:

1) Identify the range of issues that would be related to a potential Green Line extension to Northgate.
2) Develop policy recommendations in CTIP regarding a Green Line extension. However, we would not expend major effort to evaluate and formulate recommendations on a Green Line Northgate alignment or supporting infrastructure.

Figure 2: Map of the Seattle Monorail Project Extension Corridors



2. Financing Sources

One of the important issues that will influence the direction of the Northgate CTIP is if, and at what point in the planning process, the CTIP should be financially constrained within current funding levels.

If the CTIP is financially constrained at the outset, new, bold or innovative ideas, which may be funded through regional grants or other financing possibilities, might not be considered and evaluated in this study. On the other hand, if financial reality is not introduced early in the plan development process, we may waste resources defining unlikely investments and unduly raising expectations.

The issues of potential transportation financing resources may impact more than just the CTIP and the Northgate area. City leadership may wish to consider some or all of these possible revenue sources in light of city-wide impacts:

- Development impact fees;
- Local Improvement District financing;
- Transportation Benefit District financing;
- Employee tax for transportation improvements;
- Additional general fund allocation to transportation;
- Partnership opportunities involving the use of street rights-of-way, including street vacations;
- Partnership opportunities via neighborhood grant allocations.

The study team would look for City guidance in determining how much the communities and agencies may be willing to pay, who should pay, and through what mechanisms.

Assumptions:

1) Clarify the potential investment level that the City may make under the City's current financial capability early in the CTIP planning process.
2) Develop CTIP recommendations that can be funded within the City's current financial capability as a starting point.
3) Identify other potential funding sources and identify steps needed to implement each funding source.

3. System Performance Measures

One of the key tasks in the CTIP process is to identify deficiencies in the transportation system. At issue is how the system deficiencies should be defined, particularly related to 1) pedestrian facilities, 2) bike facilities, 3) transit facilities, 4) residential streets and 5) arterial roadways and intersections. While the level of service standards in the City's Comprehensive Plan Transportation Element are important for the City's concurrency management system, they may not be a sufficient performance indicator for subarea transportation planning such as CTIP. A more detailed set of performance measures and benchmarks may better illustrate the potential benefits of recommended improvements.

Performance measures are defined as:

> "Measurement or evaluation of how a system is performing to meet its goals and objectives".

Indicators are defined as:

> "components and/or characteristics that can be used to define the performance measure. Generally, a performance measure consists of several indicators."

Benchmarks are defined as:

> "Acceptable conditions in each transportation system".

Recommended Performance Measures and Benchmarks

The performance measures, consisting of indicators and benchmarks should be regarded as an initial set to prepare for the development of CTIP. As more information is assembled throughout the duration of the study, the benchmarks may potentially be adjusted.

The following key components of Northgate's transportation system will be evaluated using the recommended measures and benchmarks.

- Mode share
- Transportation system for pedestrians
- Transportation system for bicyclists
- Transit system
- Transportation system for vehicles

Mode Share

Travel mode share by transit, carpool, pedestrian and bicycle (non-single occupant vehicles) modes indicates how efficiently the transportation system is used. The Transportation Element of the Comprehensive Plan recommends mode choice goals for 2010 and 2020 as does the Northgate Area Comprehensive Plan.

The Northgate Area Comprehensive Plan and Northgate Overlay District in the Land Use Code (SMC 23.71) includes the maximum PM peak hour SOV mode use for commercial and residential trips generated by projects above a certain trip generation threshold. After year 2000, the maximum SOV use goal is set at 55 percent for both commercial and residential trips. However, the mode share goals recommended in the Transportation Element (shown below) appear to be more useful, considering the 2000 Census survey data.

Mode Share Performance Measures:

Indicator	Benchmark
Work Trips by workers within the Urban Center	2010: 70% or less drive alone 2020: 60% or less drive alone
All Trips by Residents within the Urban Center	2010: 45% or less drive alone 2020: 40% or less drive alone

Transportation System for Pedestrians

Key indicators for a safe and effective pedestrian system for the Northgate area will include arterial crossings, connections between major destinations, connections between neighborhoods and the Northgate Urban Center, and connections within neighborhoods to local schools, parks, the transit center, and neighborhood commercial districts. The performance of these indicators will be measured through field observations and comments the consultant team receives at public meetings and those made by the Northgate Stakeholders.

Pedestrian System Performance Measure:

Indicator	Benchmark
Intersections and Mid-Block Crossings (including those defined in Open Space/Pedestrian Plan) Northgate Way Corridor I-5 Southbound ramps, 1st Avenue NE, 3rd Avenue NE, 5th Avenue NE, 8th Avenue NE, Roosevelt Way, and a section between 5th Avenue and 7th Avenue 5th Avenue NE Corridor Northgate Way, NE 106th Street (Community Center), NE 103rd Street, NE 100th Street, NE 92nd Street, NE 105th Street, NE 112th Street, NE 85th Street 8th Avenue NE Corridor North of Northgate Way NE to Post Office Roosevelt Way Corridor Street sections between NE 112th Street and Northgate Way, and between NE 88th Street and NE 92nd Street 15th Ave NE Corridor North of NE 94th Street, access to Sacajawea Elementary School, NW Puppet Center, NE 117th Street – NE 125th Street 3rd Avenue Corridor between NE 100th Street and NE 103rd Street (New Street) NE 100th Street, NE 103rd Street Meridian Avenue N Corridor A section between N 103rd Street and N 105th Street, 115th Ave N/Meridian Ave N	
Pedestrian Accidents Crossing Width Conflicting Turning Volumes Average Daily Volumes Refuge Space Average Speed Pedestrian Signals Activated Pedestrian Signals ADA-Compliant Ramps Streetlights	Qualitative and quantitative analysis to determine adequacy
Indicator	Benchmark
Neighborhoods to urban center (arterials including trail segments through public open space)	
Connectivity (Sidewalks) Characteristics of pedestrian facilities such as street lights, sidewalk space, pavement conditions (such as tree grate displacement, lack of maintenance, etc)	Acceptable when equals 90% of total arterial linear arterial distance times two(2)*, and qualitative assessment of pedestrian facilities to determine adequacy
* Sidewalks on both sides of a street will be evaluated.	

Indicator	Benchmark
Within Urban Center (connectivity targets defined in open space and pedestrian plan) Between North Seattle Community College and Northgate Transit Center Between Northgate Mall and Northgate Transit Center Between Northgate Mall and future Link Light Rail station Between Northgate Mall and Northgate Community Center/Library Between Northgate Mall and Northgate North Center Between Northwest Hospital and Northgate Mall Between Office center south of NE 100th Street and Northgate Mall Pedestrian Access to QFC at Roosevelt Way and NE 112th Street 8th Avenue NE between Northgate Way to NE 92nd Street	
Connectivity (Pedestrian facilities that may include sidewalks, trails, etc.) Quality of pedestrian connection	Acceptable when equals 90% of total linear street distance of all connections combined times two(2)* and qualitative assessment of pedestrian facilities to determine adequacy
* Sidewalks on both sides of a street will be evaluated.	

Indicator	Benchmark
Neighborhoods to Parks, Library, Schools, Local Businesses and Transit Center (arterials and local streets)	
Obstacles (minimum space necessary for two persons to walk continuously)	None within 1/2 mile radius of parks, library and neighborhood commercial districts
Connectivity (sidewalks) and quality of sidewalks	90% of total arterial linear distance times two(2)* and qualitative assessment of pedestrian facilities to determine adequacy
School Walk Routes	90% have sidewalks on one side within each school walk zone
* Sidewalks on both sides of a street will be evaluated.	

Transportation System for Bicyclists

The measure for bicycle facilities on designated bicycle routes (Figure 3) will assess whether adequate bicycle facilities are provided on the City's designated bicycle routes in the CTIP study area. The bicycle facilities for this purpose are bicycle lanes, shared use lanes (wider curb lanes), and multi-purpose trails. The City's designated bike routes and all arterials will be evaluated using the indicators shown below, from which an level of service score, which is called the Bicycle Performance Index (BPI), will be derived. BPI benchmarks will vary according to roadway type and area as follows.

The proposed bicycle level of service attempts to indicate bicyclist comfort level for specific roadway geometries and traffic conditions. Each of the indicators listed in the recommended benchmark table are weighted according to a mathematical equation. From this computation, the scores can be obtained. Bicycle Performance Index is defined

with ranges of the score. For example, BPI **B** is defined with the score between 1.51 and 2.50, and BPI **C** is a range of the score between 2.51 and 3.5.

Bicycle System Performance Measure:

Indicator	Benchmark
Traffic Conditions (Average Daily Trips, Percent of Heavy Vehicles)	Bike routes within 1/2 mile of a recreational facility or schools: BPI **B** Bike routes along non-arterials: BPI **B** Bike routes along arterials: BPI **C** (FHWA's Bicycle Compatibility Index and Updates)
Roadway Design (Number of Lanes, Speed Limit, Width of Outside Lane)	
Roadway Surface Conditions	

Figure 3. Existing and Proposed Bicycle Routes

Transit System

Key indicators for convenient and effective transit service for Northgate residents and employers will include transit services provided in the Seattle's Urban Village Transit Network, and transit services in the Secondary Network for Northgate households, with specific measures for senior households. The bus routes will be grouped based on Northgate residents' travel destinations. For example, one set of the routes will serve local/neighborhood facilities such as the Northgate mall, community center, Northgate Community College, etc. and others will serve major destinations such as downtown Seattle and University of Washington.

Transit System Performance Measure:

Indicator	Benchmark
Urban Village Transit Network	
Frequency (per UVTN Report)	7-15 minutes
Span of Service (per UVTN Report)	16 – 18 hours
Loading	<100% capacity
Reliability (per UVTN Report)	> 60% services running < 1 minute late
Transit Vehicle Speed	> 30% of the speed limits
Senior Households (Residents in multi family senior facilities)	
Transit Service for 90% of Senior Households within 1/8 mile of Routes Serving the Destinations Below:	
Downtown Seattle and University District	<15 minute peak and midday
Other Urban Centers	<30 minute peak and midday
Local Destinations	<30 minute peak and midday
Households (Secondary Transit Network)	
Transit Service for 60% of All Other Households within 1/4 mile of Routes Serving the Destinations Below:	
Downtown Seattle and University District	<15 minute peak and midday
Other Urban Centers and Nearby Urban Villages	<15 minute peak and 30 minute midday
Transit Service for 70% of All Other Households within 1/4 mile of Routes Serving the Destinations Below:	
Local Destinations	<30 minute peak and midday

Transportation System for Vehicles

Performance of the transportation system for vehicles will be evaluated according to Traffic Safety, Non-Arterial/Residential Street, Arterial Corridor Level of Service, and Arterial Signalized Intersection Level of Service.

Traffic Safety

Traffic safety will be measured with the number of accidents and traffic accident rates. The rates will be defined by average annual accidents per million vehicles at intersections and mid-block locations will be derived from the last 5-years of traffic collision records maintained by the City.

Traffic Safety Performance Measure:

Indicator	Benchmark
Averaged number of Accidents for Signalized Intersections	10 per year
Averaged number of Accidents for Unsignalized Intersections and Mid-block Locations	5 per year
Accident Rates for Signalized Intersections	Intersections within the top one-quarter (ranked highest to lowest rates)
Accident Rates for Unsignalized Intersections	Intersections within the top one-quarter (ranked highest to lowest rates)
Accident Rates for Mid-block Locations	Mid-block locations within the top one-quarter (ranked highest to lowest rates)

Non-Arterial/Residential Street

Non-arterial/ residential street will be evaluated in terms of traffic volume, speed and design characteristics.

The traffic volume benchmark proposed below is an attempt to establish a balance between neighborhood generated traffic and a reasonable volume of through traffic.

The traffic speed benchmark assumes that 85% of all motorists should be at or under 28 MPH. While the ideal condition is that all drivers comply with the speed limit, the proposed benchmark attempts to strike a balance between the ideal condition and actual speed conditions typical of Seattle streets. Striking this balance will enable the Plan to identify how to best prioritize improvements given limited resources.

In addition, CTIP recognizes that traffic volumes and speeds are not the only transportation related indicators of how "livable" residents believe their local streets to be. The presence or absence of other important street features such as curbs, sidewalks, street width, street trees and parking, should also be considered.

Non-arterial (local) streets that CTIP will identify as key pedestrian connections will be evaluated according to the volume and speed benchmarks shown below and through an assessment of other indicators such as sidewalks and curbs. As a possible consequence of this fuller analysis, local streets that meet the proposed benchmarks for volume and speed may also be seen to warrant improvements, such as the installation of a sidewalk. In addition, all local streets that exceed the volume and speed benchmarks will be considered for both traffic calming and infrastructure improvements.

The Northgate Area Comprehensive Plan includes a policy stating that traffic circulation will be directed onto arterials to protect the neighborhood from avoidable intrusion of through traffic. It specifically lists the following streets for aiming at reducing traffic, speeds, and pedestrian vehicular conflicts with operational and design controls, including sidewalks:

- Ashworth Avenue N
- NE 115th Street between Lake City Way and 5th Avenue NE
- NE 107th Street between 15th Avenue NE and 23rd Avenue NE
- 23rd Avenue NE
- Pinehurst Way between NE 120th Street and NE 125th Street
- Maple Leaf local access streets
- NE 98th Street between Lake City Way and 15th Avenue NE

Non-arterial/Residential Street Performance Measure:

Indicator	Benchmark
Traffic Volume	700 vehicles per day
Traffic Speed	28 mph (85th percentile) (Note: 85 percent of vehicles travel at speeds at or below 28 miles per hour)
Accident History	Average of 1.0 per year or more over prior 3 years
Design Characteristics	Examples include presence/absence of sidewalks and curbs, street width, planting strip and parking.

Arterial Corridor Level of Service

Arterial corridor level of service (LOS) will be measured in terms of average speeds during the PM peak period. The Highway Capacity Manual (HCM) 2000 method will be applied. The following arterials will be selected for this analysis:

NE 130th Street/ NE 125th Street between Meridian Avenue and Lake City Way

Northgate Way between Meridian Avenue and Lake City Way

Meridian Avenue N between NE 120th Street and NE 92nd Street

1st Avenue NE between Northgate Way and NE 92nd Street, and between Northgate Way and NE 130th Street

5th Avenue NE between NE 130th Street and Northgate Way, and between Northgate Way and NE 85th Street

Roosevelt Way NE/Pinehurst Way NW between NE 117th Street (15th Avenue) and NE 85th Street

15th Avenue NE between NE 125th Street and Northgate Way and between Northgate way and NE 85th Street

LOS E is defined with average speeds in a range of 7 to 13 miles per hour, depending on the Street Class. Arterials will be classified for the purpose of the roadway corridor LOS analysis based on free-flow speeds.

Arterial Corridor Level of Service Performance Measure:

Indicator	Benchmark*
Travel Speed	Level of Service E
* The benchmarks for the arterial corridors will be reviewed when the future baseline forecasts become available. It is possible that changes to the benchmarks may be needed.	

Arterial Signalized Intersection Level of Service

Arterial signalized intersection level of service will be using the HCM 2000 intersection delay method. Average vehicle delay at each arterial intersection will be calculated with Synchro 6 for the PM peak hour. Instead of focusing on the individual intersections, the performance of the intersections may be evaluated based on averaged intersection delay within key arterial corridors, including those intersections identified in the Northgate Area Comprehensive Plan.

Arterial Signalized Intersection Level of Service Performance Measure:

Indicator	Benchmark*
Intersection Delay at Each Intersection	Level of service at each arterial intersection will be reported. (Specific benchmark will not be established because it would be more meaningful to evaluate the performance of the aggregated intersections than the performance of individual intersections for an Urban Center area.)
Averaged Delay Among Intersections	LOS E within a key arterial corridor
* The benchmarks for the arterial intersections will be reviewed when the future baseline forecasts become available. It is possible that changes to the benchmarks may be needed.	